

Designing Craters: Creating a Deep Impact

Scoring Suggestions: Reporting to the Deep Impact Team

TEACHER HANDOUT

REPORTING TO THE DEEP IMPACT TEAM, PART 1:

Rank each answer between 0-5. Answers will vary, so use your own judgment, but the table below lists some characteristics of a good answer. Total the scores and divide by 5 to determine the average. Possible grade equivalents:

>4.0 = A

3.0 – 3.9 = B

2.0 – 2.9 = C

1.0 – 1.9 = D

Question 1		
* Transfers the values from "Looking for Patterns"		
Score for Question 1:		
Question 2		
* Mentions that comets are composed of ice		
* Includes any other related facts about composition or structure of comets		
Score for Question 2:		
Question 3		
* Mentions the differences in surface (For example, can include differences in materials, in composition, and/or differences in particle size - as in, classroom experiments conducted in loose flour, surface of comet may be "more solid")		
* Mentions any specific differences between the conditions under which predictions were made in class experiment versus the conditions of an actual impact on a comet (e.g., predictions made for a mass traveling at slower speeds, predictions made for a smaller mass, etc.)		
Score for Question 3:		
Question 4		
* Mentions greater speed or mass may need to be used as a result of differences in composition		
Score for Question 4:		
Question 5		
* Expresses the need to test using materials more similar to those of the comet		
* Suggests any other tests that would give more accurate information about what to expect		
Score for Question 5:		
Total Points		
Average Score (Total ÷ 5)		

REPORTING TO THE DEEP IMPACT TEAM, PART 2:

Rank each answer between 0-5. Total the points earned in **Cratering Event** and **Science Process**. Then, average the scores by adding the totals of each section together and dividing by 4.

>4.0 = A

3.0 – 3.9 = B

2.0 – 2.9 = C

1.0 – 1.9 = D

Cratering Event:

Storyboard covers entire process from start to finish		
Storyboard is clearly labeled & easy to tell what is going on		
Mentions factors in determination of crater size including:		
• Mass of impactor		
• Velocity of impactor		
• Mass of target body		
• Material properties of target body (density, elasticity, etc.)		
Explanation of cratering process is logical and consistent with what was seen in class		
Total Points for Cratering Event		

Science Process:

Since this section asks about changes in the student's perception, answers will vary widely. However, you can look for the following points in their description of how to conduct a scientific investigation. An answer that mentions at least five of these points would be a good answer.

Brainstorms initial ideas		
Evaluates ideas for likelihood, feasibility		
Designs experiment to test ideas		
Analyzes data		
Collaborates with others and communicates findings		
Finds patterns useful for making predictions		
Tests predictions		
Revises ideas		
Models larger scale events with small scale		
Finds mathematical descriptions of the patterns in your data		
Total Points for Science Process		
Total Points for Cratering Event (from chart above)		
Total Points for Both Sections Combined		
Average Score (Total Points ÷ 4)		